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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JEFFREY E. HANNEMAN,
BRIAN WARN, and LEONARD J. QUADRACCI

Appeal 2016-006217
Application 13/473,568[1]
Technology Center 2100

Before JEAN R. HOMERE, JASON V. MORGAN, and
PHILLIP A. BENNETT, *Administrative Patent Judges*.

MORGAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Introduction

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–20. Final Act. 4–15. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Invention

Appellants' invention relates to the use of Autoassociative or Heteroassociative Memory, applied to a plurality of patterns, to predict a

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[1] Appellants identify The Boeing Company as the real party in interest. App. Br. 1.

possible mission outcome or future event. Abstract; Spec. ¶ 10. Autoassociative Memory enables the recall of data using a portion of the data to recall while Heteroassociative Memory associates "a completely different attribute from those attributes presented as inputs." Spec. ¶ 37.

Exemplary Claim

Exemplary claim 1 is reproduced below:

> 1. A method comprising:
>
> identifying a set of mission attributes; and
>
> using a computer to apply Autoassociative Memory to a plurality of patterns to predict at least one of a mission outcome and a future event that, given the set of mission attributes, might occur during execution of a mission.

Rejections

The Examiner rejects claims 1–20 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Final Act. 4–5.

The Examiner rejects claims 1–20[2] under 35 U.S.C. § 103(a) as being unpatentable over Jan Jelinek and Datta Godbole, *Model Predictive Control of Military Operations*, Procs. of the 39th IEEE Conf. of Dec. and Cont., pp. 2562–67, Sydney, Australia, Dec. 2000 ("Jelinek") and Aparicio et al. (US 6,581,049 B1; issued June 17, 2003). Final Act. 5–15.

[2] The Examiner incorrectly omits claims 2, 3, 10–13, 16, and 17 from the statement of the rejection. Final Act. 5. However, these claims are addressed in the body of the rejection. *Id.* at 7, 9–11, and 13–14. We hold this error harmless.

ANALYSIS

35 U.S.C. § 101

Patent eligibility is a question of law that is reviewable de novo. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012). To be statutorily patentable, the subject matter of an invention must be a "new and useful process, machine, manufacture, or composition of matter, or [a] new and useful improvement thereof." 35 U.S.C. § 101. There are implicit exceptions to the categories of patentable subject matter identified in § 101, including: (1) laws of nature, (2) natural phenomena, and (3) abstract ideas. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014). The Supreme Court has set forth a framework for distinguishing patents with claims directed to these implicit exceptions "from those that claim patent-eligible applications of those concepts." *Id.* (citing *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S. Ct. 1289 (2012)). The evaluation follows the two-part analysis: (1) determine whether the claim is directed to a patent-ineligible concept, e.g., an abstract idea; and (2) if a patent-ineligible concept is present in the claim, determine whether any element, or combination of elements, in the claim is sufficient to ensure that the claim amounts to significantly more than the patent-ineligible concept itself. *See Alice*, 134 S. Ct. at 2355.

In rejecting claims 1 and 14 under 35 U.S.C. § 101, the Examiner finds the claims are directed to the use of Autoassociative Memory to predict a mission outcome. *See* Final Act. 4. Similarly, the Examiner rejects claim 10 as being "directed to the use of heteroassociative memory in detecting new patterns." *Id.*

With respect to claim 1, Appellants contend the Examiner erred because "[n]one of the claims recit[ed] Associative Memory per se." App. Br. 16. Rather, Appellants argue, "[t]he claims recite something 'significantly more' than Associative Memory." *Id.* Specifically, "[t]hese claims recite the use of prediction patterns and Autoassociative Memory to predict an outcome of a mission and/or an event that occurs during the mission." *Id.* at 17. Appellants also argue "these claims recite a computer programmed with Autoassociative Memory. Such a computer is not a generic machine, it is a particular machine." *Id.* at 18; *see also* Reply Br. 4 ("A computer used in conjunction with the current claims must first be modified to support the autoassociative and heteroassociative memories and then can be adapted to addressing the problem being solved").

Appellants' arguments unpersuasively fail to show that the claimed invention is directed to something other than or significantly more than the abstract idea of using Autoassociative Memory to predict events such as a mission outcome. Data labels such as "mission attributes," "mission outcome," and "future event" fail to transform the claimed use of input data (i.e., mission attributes) to produce predictive output data (i.e., mission outcome or future event) into a non-abstract concept; such prediction is akin to, but even more abstract than, the abstract concept of risk hedging. *See Bilski v. Kappos*, 561 U.S. 593, 599, 611–12 (2010). Generic recitations such as "using a computer" fail to add anything significantly more to the abstract idea of using an Autoassociative Memory. And, the Autoassociative Memory itself is described in the Specification as an abstract concept, not as a particular device or even as a general purpose computer modified using particular algorithms. *See, e.g.*, Spec. ¶ 56

("Given the set of patterns (x1, x2, . . , xi, xi+1, . . , xn), the Autoassociative Memory uses the set of known attributes (x1, x2, . . . , xi) to complete one of the patterns and returns (x1, x2, . . . , xi) + (xi+1, . . . , xn)").

For these reasons, we agree with the Examiner that claim 1 is directed to non-statutory subject matter. Accordingly, we sustain the Examiner's 35 U.S.C. § 101 rejection of claim 1, and claims 2–7, 9, and 14–20, which Appellants do not argue separately. App. Br. 17–18.

Appellants make similar arguments with respect to claim 10, which is directed to the abstract concept of "applying Heteroassociative Memory . . . to create new patterns." *See id.* at 17. These arguments are similarly unpersuasive for the reasons discussed above. Accordingly, we also sustain the Examiner's 35 U.S.C. § 101 rejection of claim 10, and claims 11–13, which Appellants do not argue separately.

Appellants further argue that claim 8—which indirectly depends from claim 1—"is even further removed from pre-empting the use of Autoassociative memory" because claim 8 recites post-solution activity that "includes deciding whether to proceed with the mission, modify it, or abort it based on the prediction." App. Br. 18. However, we agree with the Examiner that "making a decision in light of a prediction is what would be expected from any prediction – indeed it is the reason why predictions are made." Ans. 15. Merely making a decision based on a prediction, in the manner recited in claim 8, does not add anything significantly more to the underlying abstract concept of using Autoassociative Memory to make a prediction. Such decision making encompasses the human activity of reacting to a prediction, which, like making the prediction itself, is abstract.

Accordingly, we also sustain the Examiner's 35 U.S.C. § 101 rejection of claim 8.

35 U.S.C. § 103(a)—Claims 1–9 and 14–20

In rejecting claim 1 under 35 U.S.C. § 103(a), the Examiner finds that Jelinek's use of "assets, lethality, and radar tracking capability" teaches or suggests the claimed *identified set of mission attributes*. Final Act. 5–6 (citing Jelinek 2563). The Examiner further relies on Jelinek's process for determining a corrective action to take to teach or suggest *predicting at least one of a mission outcome and a future event*. Final Act. 6 (citing Jelinek 2563). The Examiner acknowledges that Jelinek does not use Autoassociative Memory in the manner claimed, but instead relies on Aparicio's use of Autoassociative Memory in prediction and pattern matching to teach or suggest *using a computer to apply Autoassociative Memory to a plurality of patterns* to make the claimed prediction. Final Act. 6 (citing Aparicio col. 5, ll. 13–18, 40–48); Ans. 14 (citing Aparicio col. 5, ll. 49–59).

Appellants contend the Examiner erred because the cited portions of Aparicio neither "describe how Autoassociative Memory may be used to predict a mission outcome, given a set of mission attributes" nor are directed to "applying the Autoassociative Memory to a plurality of prediction patterns." App. Br. 12.

Appellants' arguments are persuasive because, as Appellants correctly note, "Jelinek relies on probability models and Monte Carlo simulations" to make its predictions. *Id.*; *accord* Jelinek 2562. The Examiner's findings do not show that it would have been obvious to an ordinarily skilled artisan to substitute Aparicio's Autoassociative Memory for the probability models

and Monte Carlo simulations of Jelinek. That is, the Examiner has not shown that Aparicio's Autoassociative Memory is itself a probabilistic model or would have been obvious to use as a substitute for a probabilistic model. Therefore, we agree with Appellants that the Examiner's findings do not show that the method of claim 1 would have been obvious in light of Jelinek and Aparicio.

Accordingly, we do not sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 1, and claims 2–9 which depend therefrom. Similarly, we do not sustain the Examiner's 35 U.S.C. § 103(a) rejection of claims 14–20, which have similar recitations.

35 U.S.C. § 103(a)—Claims 10–13

Claim 10 differs from claim 1 because claim 10 *applies Heteroassociative Memory to a plurality of memory entities to create new patterns of the attributes*. However, the Examiner similarly relies on Jelinek for the inputs and outputs of the process (i.e., historical data and the prediction of an event or mission outcome) and on Aparicio to teach or suggest the claimed use of Heteroassociative Memory. *See* Final Act. 9–10 (citing Jelinek 2563; Aparicio col. 5, l. 49–col. 6, l. 9, col. 15, ll. 12–23).

Appellants contend the Examiner erred because "Jelinek doesn't describe any patterns, it describes the use of probability models and Monte Carlo simulations to predict an outcome of a mission." App. Br. 11. Appellants contend Aparicio's disclosure related to the "scaling of high performance prediction and pattern matching" (Aparicio col. 5, ll. 46–47) fails to cure this deficiency in Jelinek because Aparicio "is silent about *generating patterns* based on matrices of attributes . . ." (App. Br. 9 (emphasis added); *see also* Reply Br. 2–3).

The Examiner finds "the scaling problem was encountered specifically in using the prior art of Aparicio to *make predictions*." Ans. 13 (emphasis added). However, the Examiner's findings do not show that using Heteroassociative Memory to *make predictions* teaches or suggests using such memory to *create new patterns*. Moreover, the Examiner's findings do not show that it would have been obvious to an ordinarily skilled artisan to substitute Aparicio's Heteroassociative Memory for Jelinek's probability models and Monte Carlo simulations. *See*, *e.g.*, Final Act. 10. Therefore, we agree with Appellants that the Examiner's findings do not show that the method of claim 10 would have been obvious in light of Jelinek and Aparicio.

Accordingly, we do not sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 10, and claims 11–13, which depend therefrom.

DECISION

We affirm the Examiner's decision rejecting claims 1–20 as being directed to non-statutory subject matter under 35 U.S.C. § 101. However, we reverse the Examiner's rejection of claims 1–20 as being unpatentable over the combination of Jelinek and Aparicio.

Because we have affirmed at least one ground of rejection with respect to each claim on appeal, the Examiner's decision is affirmed. *See* 37 C.F.R. § 41.50(a)(1).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED